

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

Claim Amendments

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (currently amended): A method for transmitting at least one measuring position of a structural element for measuring a characteristic dimension in a microscope, which element is about to be formed on a mask for lithographic projection, which comprises:

defining, in a first user unit, a circuit layout containing the structural element that is to be formed;

transferring the circuit layout into a file with a format in which the structural element that is to be formed is represented by first data information including an allocation of a position to a geometric shape;

generating second data information in the circuit layout transferred into the file;

allocating a second geometric shape to the at least one measuring position in the second data information to prevent

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

the second geometric shape from bringing about the formation of an exposed structure on the mask in the event of an exposure;

transmitting to a second user unit the circuit layout transferred into the file and containing the second data information;

reading, in the second user unit, ~~a~~ the at least one measuring position of the second data information in the circuit layout transmitted with the file;

forming a control instruction for an exposure apparatus from the circuit layout;

exposing the mask with a structure pattern; and

finding the structural element on the mask at the at least one measuring position in a measuring device and measuring the characteristic dimension of the structural element by transmitting the mask and the at least one measuring position to a third user unit.

Claim 2 (original): The method according to claim 1, which further comprises:

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

additionally allocating a first transparency to the first geometric shape of the first data information; and

additionally allocating a second transparency different from the first transparency to the second geometric shape of the second data information.

Claim 3 (currently amended): The method according to claim 1, which further comprises situating the at least one measuring position in a vicinity of the position of the first data information of the structural element that is to be formed on the mask.

Claim 4 (original): The method according to claim 1, which further comprises configuring the first and second data information as cells in a hierarchical structure of cells, each of the cells including a separate coordinate system with an origin coordinate and each cell being linked with a cell respectively thereabove in the hierarchical structure by a position of a respective origin coordinate in the coordinate system of the higher-ranking cell.

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

Claim 5 (original): The method according to claim 4, which further comprises selecting GDSII as the standardized file exchange format.

Claim 6 (original): The method according to claim 1, which further comprises utilizing, as the measuring device, one of the group consisting of a scanning electron microscope, an optical microscope for determining the width of a structural element, and an optical microscope for determining the positional accuracy of a structural element.

Claim 7 (currently amended): The method according to claim 1, which further comprises carrying out the steps of the method for a number of structural elements with each having a respective at least one measuring position, respectively.

Claim 8 (currently amended): The method according to claim 7, which further comprises providing the circuit layout as a memory cell field.

Claim 9 (currently amended): The method according to claim 8, which further comprises allocating a structural element located within approximately 10 µm of a margin of the memory cell field to one of the two items of data information of the at least one measuring positions position.

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

Claim 10 (currently amended): A method for transmitting a circuit layout including at least one measuring position of a structural element for measuring a characteristic dimension, which element is about to be formed on a mask for lithographic projection, which comprises:

defining, in a first user unit, a circuit layout containing the structural element that is to be formed, the circuit layout including at least a first plane;

transferring the circuit layout into a file with a format in which the structural element that is to be formed is represented by first data information including an allocation of a position to a first geometric shape;

allocating the first data information to the at least one first plane;

generating a second plane to which is allocated no further data information representing structural elements that are to be formed;

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

generating second data information in the second plane
including an allocation of a position to a second geometric
shape in the circuit layout transferred into the file;

transmitting to a second user unit the circuit layout
transferred into the file and containing the second data
information;

reading, in the second user unit, a measuring position of the
second data information in the circuit layout transmitted with
the file;

forming a control instruction for an exposure apparatus from
the circuit layout;

exposing the mask with a structure pattern; and

finding the structural element on the mask at the measuring
position in a measuring device and measuring the
characteristic dimension of the structural element by
transmitting the mask and the measuring position to a third
user unit.

Claim 11 (original): The method according to claim 10, which
further comprises:

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

additionally allocating a first transparency to the first geometric shape of the first data information; and

additionally allocating a second transparency different from the first transparency to the second geometric shape of the second data information.

Claim 12 (original): The method according to claim 10, which further comprises situating the measuring position in a vicinity of the position of the first data information of the structural element that is to be formed on the mask.

Claim 13 (original): The method according to claim 10, which further comprises configuring the first and second data information as cells in a hierarchical structure of cells, each of the cells including a separate coordinate system with an origin coordinate and each cell being linked with a cell respectively thereabove in the hierarchical structure by a position of a respective origin coordinate in the coordinate system of the higher-ranking cell.

Claim 14 (original): The method according to claim 13, which further comprises selecting GDSII as the standardized file exchange format.

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

Claim 15 (original): The method according to claim 10, which further comprises utilizing, as the measuring device, one of the group consisting of a scanning electron microscope, an optical microscope for determining the width of a structural element, and an optical microscope for determining the positional accuracy of a structural element.

Claim 16 (original): The method according to claim 10, which further comprises carrying out the steps of the method for a number of structural elements with at least one measuring position, respectively.

Claim 17 (currently amended): The method according to claim 16, which further comprises providing the circuit layout as a memory cell field.

Claim 18 (currently amended): The method according to claim 17, which further comprises allocating a structural element located within approximately 10 μm of a margin of the memory cell field to one of the two items of data information of the measuring positions position.

Claim 19 (currently amended): A method for transmitting at least one measuring position of a structural element for

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

measuring a characteristic dimension, which element is about to be formed on a mask for lithographic projection, which comprises:

defining, in a first user unit, a circuit layout with the structural element that is to be formed;

transferring the circuit layout into a file with a format in which the structural element that is to be formed is represented by first data information including an allocation of a position to a geometric shape;

generating second data information in the circuit layout transferred into the file;

allocating a reference string or name to the at least one measuring position in the second data information;

transmitting to a second user unit the circuit layout transferred into the file and containing the second data information;

reading, in the second user unit, the at least one measuring position of the second data information in the circuit layout

Applc. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

transmitted with the file with the aid of the reference string or name;

forming a control instruction for an exposure apparatus from the circuit layout;

exposing the mask with a structure pattern; and

finding the structural element on the mask at the at least one measuring position in a measuring device and measuring the characteristic dimension of the structural element by transmitting the mask and the at least one measuring position to a third user unit.

Claim 20 (withdrawn): A circuit layout for a circuit in a standardized file exchange format for transmission to a user unit for producing a mask and measuring a characteristic dimension of a structural element that is formed on the mask, comprising:

at least one exposure step-formed structural element to be formed on the mask, said structural element being represented in the exchange format by first data information including an allocation of a position to a shape with a content; and

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

a measuring position for finding said structural element in a measuring step with a measuring device, said measuring position being represented by second data information including an allocation of said measuring position to one of no geometric shape and a geometric shape having an empty content, said measuring position being represented by locating said second data information in a vicinity of said position of said first data information.

Claim 21 (withdrawn): The circuit layout according to claim 20, wherein:

said structural element is a plurality of structural elements to be formed;

each of said structural elements is represented by said first data information;

a measuring position represented by said second data information is respectively allocated to each of said structural elements; and

said second data information forms a configuration with periodic intervals in the circuit layout.

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

Claim 22 (withdrawn): In a user unit for producing a mask and measuring a characteristic dimension of a structural element that is formed on the mask with a measuring unit, a circuit layout for a circuit in a standardized file exchange format for transmission to the user unit, the circuit layout comprising:

at least one exposure step-formed structural element to be formed on the mask, said structural element being represented in the exchange format by first data information including an allocation of a position to a shape with a content; and

a measuring position for finding said structural element in a measuring step with the measuring device, said measuring position being represented by second data information including an allocation of said measuring position to one of no geometric shape and a geometric shape having an empty content, said measuring position being represented by locating said second data information in a vicinity of said position of said first data information.

Claim 23 (withdrawn): The circuit layout according to claim 22, wherein:

Applic. No. 10/675,772
Amdt. dated April 21, 2006
Reply to Office action of January 23, 2006

said structural element is a plurality of structural elements
to be formed;

each of said structural elements is represented by said first
data information;

a measuring position represented by said second data
information is respectively allocated to each of said
structural elements; and

said second data information forms a configuration with
periodic intervals in the circuit layout.